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A NEW SPECIES AND A NEW VARIETY OF SOLIDAGO FROM KENTUCKY

E. Lucy Braun

In the spring of 1940, in one of the many sandstone "rock-houses" of the Red River country of Menifee County, Kentucky, in the Cumberland National Forest, the writer found plants of what appeared to be an undescribed species of goldenrod. Even at this season (early May) when the vegetative stems were about 6–10 inches tall, the distinctness of the species was evident. Dry stems of the previous autumn still retained their shriveled leaves, which when moistened could be pressed into shape, and ripe fruits still stood loosely in the dry involucres, for in the protection of a rockhouse no storms could reach the plants to batter down the delicate stems.

A revisit to the area in September was planned, but other things prevented. Then, on September 16, 1941, sixteen months after the first collection, we again ascended the "hollow," steep and rocky toward the upper end where footing was in places precarious and hand-holds lacking or uncomfortable because of the plentiful Hercules' Club (*Aralia spinosa*). In the dry sand under the sheltering roof of the rockhouse, a mass of Solidago in full bloom rewarded our efforts. The next day, more plants were found on the other side of the Red River, in Powell County.

The plant evidently belongs to the *Flexicaules* group of *Solidago*. Its decumbent habit, white-pilose stems and lower leaf surfaces, very delicate leaf-texture (leaves so thin that coarse print is readable through the leaves) and exceedingly soft feel

are features which at once are apparent. Comparison with other species of the group emphasizes the specific distinctness of the plant of this unusual habitat.

SOLIDAGO **albopilosa,** sp. nov., caulibus gracilibus, debilibus 2–5.5 dm. altis striatis dense albopilosis; foliis caulinis inferioribus medianisque late ovatis vel late ovalibus 3–6 cm. longis 3–5 cm. latis, acutis, in basem truncatum abrupte contractis, serratis tenuissimis, supra pubescentibus infra pilosis, pilis albis ad venas principales 2 mm. longis; inflorescentiae foliis similibus minoribus serratis; petiolis laminae longitudinis secundam vel tertiam partem aequantibus; involucris 4 mm. altis; bracteis obtusis, 1–3-costatis; radiis 4 vel 5; achaeniis pubescentibus.

Plants stoloniferous, without basal rosettes; short vegetative stems, however, are numerous. Stems slender, weak, often decumbent and sprawling, or even pendent, 2 to 5½ dm. long, slightly zigzag, striate, densely white-pilose. Lower and median stem-leaves broadly ovate or broadly oval, blades 3–6 (–7) cm. long, 3–5 (–6) cm. wide, acute at apex, abruptly contracted at base, base varying from slightly cordate to truncate with scarcely winged petiole to rounded with a narrow cuneate extension along petiole, serrate; leaves of the inflorescence similar but smaller, and narrower, serrate. Petioles of the cordate and truncate leaves ½ to ⅓ the length of blades, those of the oval leaves generally shorter. Leaves very thin and delicate, and exceedingly soft, pubescent above, pilose beneath with white hairs, those on the principal veins 2 mm. long. Inflorescence axillary and terminal, but thyrse, if present, very poorly developed, clusters few-flowered, the lowest occasionally 2–3 cm. long, racemosely branched and leafy-bracted; axis of inflorescence and pedicels densely white pilose. Flowers fragrant. Involucre 4 mm. high, bracts obtuse, pubescent toward tip, 1- to 3- (or occasionally 5-) ribbed, only the central rib distinct. Rays 4 or 5, rarely 3. Achenes 1.8–2.2 mm. long, pubescent, pappus capillary, 3 mm. long.—KENTUCKY: in dry or moist sandstone rockhouses of the basal Pottsville formation, head of ravine tributary to Red River between Glady Creek and Wolfpen Creek, Menifee County, May 4, 1940, *Braun*, Ky. no. 2915; same locality, Sept. 16, 1941, *Braun*, Ky. no. 4278 (TYPE in Gray Herbarium and isotypes deposited in a number of herbaria); rockhouses on Gray's Branch (also tributary to Red River), Powell County, Sept. 17, 1941, *Braun*, Ky. no. 4295; same locality, Oct. 12, 1941, *Braun*, Ky. no. 4333.

Solidago albopilosa was found growing in company with *Heuchera parviflora* var. *Rugelii* and *Silene rotundifolia*. Vegetative stems of the Solidago resemble the Silene. The goldenrod is

strictly limited to sites beneath projecting cliffs and the roofs of the rockhouses. Even though so abundant that it carpets the ground in the rockhouses, it stops abruptly at a line coinciding with the cliff margin far above. In one rockhouse on Gray's Branch, it extends under the overhanging cliff into almost dark crevices, there growing with filmy fern, *Trichomanes Boschianum.* The habitat is similar to, but drier than that in which *Eupatorium deltoides** was found. As yet the two species have not been found in the same rockhouse. The nearest station for the Eupatorium is about 5 miles from those of the Solidago.

Just beyond the outer line of growth, in both stations, one plant was found which had taller, less weak although slender stems, larger and proportionately narrower leaves less abruptly contracted at the base, less pilose stems and leaves, and 3 to 4-rayed heads. One (no. 4279, Menifee Co.) has a fairly well developed terminal thyrse as well as axillary clusters, suggesting the inflorescence of *S. latifolia;* in the other, the inflorescence is almost entirely of axillary clusters. In leaf-shape, but not in stature, in pubescence nor inflorescence, these plants of marginal situation slightly resemble the form of *S. latifolia* which is common in mesophytic woods of the Red River. (*Solidago latifolia* in this area has the leaves broadest near the middle, and tapering gradually, not abruptly, to a very short petiole.) The strongest resemblance is, however, with *Solidago albopilosa.* The fragrance of the flowers of *S. albopilosa* attracts many bumble bees. As Solidago is insect-pollinated occasional transfer of pollen from one to another species in this closely related series might result in hybridization. The two intermediate plants may be hybrids.

Solidago rigida L., var. **glabrata,** var. nov., a forma typica differt caulibus foliisque glabris.

Differs from the typical form of the species in its glabrous stem and leaves.—Kentucky: in dry soil with prairie plants, near Cave City, Barren County, Sept. 11, 1940, *Braun,* Ky. no. 3629. Type in Gray Herbarium, isotype in writer's herbarium.

In appearance and stature this plant is like typical *S. rigida.* Its glabrous stems, and smooth, glabrous, almost shiny leaves will readily distinguish it from the species. Occasional scattered hairs on some of the leaves are longer, more slender and less stiff than those of the typical form, and without the coarse

* Rhodora 42: 50–51. 1940.

elevated base. The leaf-margin is hispid-ciliate, although less prominently so than in the species. Short hispid hairs, widely spaced, are arranged in lines along the branches of the inflorescence; pedicels pubescent.

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GREAT BASIN PLANTS V.—AQUATICS

Bassett Maguire and G. Hortin Jensen

The following records are presented in continuation of discussion of rare or interesting plants of the Great Basin. Grateful acknowledgment is made to the Utah Wildlife Research Unit of the Federal Fish and Wildlife Service for certain specimens made available to this paper.

Potamogeton americanus C. & S., in 12 in. of water, Stewart Lake, Uinta Co., Utah, July 10, 1938, *G. H. Jensen & L. Dargan*, no. 153.

Until this present collection came to light, no Utah material had been seen by the writers, although the species had been included by Tidestrom in the Flora of Utah & Nevada. Failure to find this plant after a number of years search had almost convinced us that it was not likely to have been found in the state, and that its inclusion in the Utah range might have been due to misinterpretation of the amphibious form of *P. gramineus* L. This latter species abounds in the state, and, in the absence of well-formed submerged leaves, strongly simulates *P. americanus*.

*Potamogeton crispus L., Ogden Bay Refuge, Weber Co., Utah, Aug. 2, 1937, *C. S. Williams*, no. 1241.

This introduced European species, known commonly from Minnesota eastward and sparingly from the Pacific Coast region, is now apparently collected only from the above station in the entire Rocky Mountain and Great Basin areas.

*Potamogeton filiformis Pers. (*P. interior* Rydb.), along dike, East Lake, Locomotive Springs, Box Elder Co., Utah, Sept. 15, 1936, *D. Hobson & Geo. Piranian*, no. 14850; Lyman Lake, Black's Fork River, Wasatch National Forest, Summit Co., Utah, July 27, 1939, *D. Hobson*, no. 51.

* The asterisk designates plants which are thought previously to have been unreported from our region.

The typical form seems to be considerably less common in Utah than the var. *borealis* (Raf.) St. John, and less frequent than the following.

Potamogeton filiformis Pers. var. *Macounii Morong, shallow water, Unit 2, Bear River Refuge, Box Elder Co., Utah, Sept. 12, 1932, *Maguire*, no. 3183; eddies of Salmon River, 10 mi. N. Challis, Custer Co., Idaho, July 15, 1934, *Maguire & Maguire*, no. 5434; Strawberry River, Wasatch National Forest, Wasatch Co., Utah, Sept. 8, 1939, *D. Hobson*, no. 39; side stream, West Fork, Smith's Fork, vic. Hewinta, Wasatch National Forest, Summit Co., Utah, July 10, 1939, *D. Hobson*, no. 31: abundant, shallow stream, 1 mi. W. Moroni, Sanpete Co., Utah, June 13, 1940, *Maguire*, no. 18651; frequent, shallow, rapidly flowing water, Fremont River, 1 mi. E. Fruita, Wayne Co., Utah, July 1, 1940, *Maguire*, no. 19273. All of the above collections seem to come well within the var. *Macounii* as delimited by St. John (1916), except *Maguire*, no. 18651 from Sanpete Co., Utah. The specimens of this collection strongly suggest a condition intermediate to *P. vaginatus* in the development of excessively large primary leaf sheaths.

The following three collections are intermediate between typical *P. filiformis* and the var. *Macounii:* warm springs along San Carlos River, San Carlos Indian Reservation, Gila Co., Ariz., March 30, 1935, *Maguire*, no. 10335; Posey Lake, Garfield Co., Utah, Sept. 3, 1936, *Geo. Piranian;* in 5 ft. of water, Tony Grove Lake, 8000 ft., Bear River Range, Cache Co., Utah, Aug. 5, 1938, *Maguire*, no. 16085.

Potamogeton foliosus Raf., var. *genuinus Fern., beaver pond, 1 mi. N. Warner Ranger Station, 9000 ft., La Sal Mts., Grand Co., Utah, Aug. 3, 1933, *Maguire et al*, no. 4368; common, Posey Lake, 9500 ft., Aquarius Plateau, Powell National Forest, June 27, 1940, *Maguire*, no. 19161; Strawberry River, Wasatch Co., Utah, Sept. 10, 1939, *D. Hobson*, no. 33; slow stream in meadow, 3 mi. n. e. Logan, Cache Co., Utah, May 21, 1939, *Maguire*, no. 16685.

Apparently only the var. *macellus* (Fernald, 1932) has previously been known in Utah.

*Potamogeton friesii Rupr., Bear Lake, W. Fk., Bear River, Summit Co., Utah, Sept. 4, 1939, *Dean Hobson*, no. 37; Lyman Lake, Black's Fk. Creek, Summit Co., Utah, July 27, 1939, *Dean Hobson*, no. 52.

Collections made in Glacier National Park, Montana (Maguire, 1934) revealed the presence of this species in the western states, extending the then known range south and westward from

British Columbia, Alberta, and North and South Dakota (Fernald, 1932). The above collections further extend the range by more than 700 miles.

*Potamogeton gramineus L. var. graminifolius Fries, common on mud and in pools in marsh which had been covered with water during spring and early summer, south end Fish Lake, Aug. 24, 1938, Sevier Co., Utah, *Maguire*, no. 16202.

In addition to this cited number many collections have been made within the state, showing it to be common and generally distributed. This species, the *P. heterophyllus* of Am. authors, is recorded by this latter name by Tidestrom (1925) from Ruby Lake, Nevada. It is possible that much of material of Utah passing as *P. americanus* is *P. gramineus*, since the amphibious form of this species, becoming very coarse, considerably resembles the former.

Potamogeton praelongus Wulfen, common in water 6–15 ft. deep, vic. Twin Creeks, Fish Lake, Sevier Co., Utah, 8900 ft., Aug. 25, 1938, *Maguire*, no. 16219; Posey Lake, Garfield Co., Utah, Sept. 3, 1936, *Geo. Piranian*, no. 556; abundant, Posey Lake, Aquarius Plateau, Powell National Forest, Garfield Co., Utah, June 27, 1940, *Maguire*, no. 19162; Stanley Lake, Challis National Forest, Custer Co., Idaho, *A. S. Hazzard.*

Recorded by Tidestrom (1925) from Fish Lake, Utah, this species proved to be quite frequent, in water from 6–18 ft. deep of this lake. It is abundant in Posey Lake, the above record adding the second known station within the state. The Idaho collection of Dr. Hazzard offers a new record for the little known distribution of the species in this state.

*Potamogeton Berchtoldi Fieb., *P. pusillus* L. var. *mucronatus* (Fieber) Graebn., spring 1 mi. west of Logan, Cache Co., Utah, 4500 ft., *Maguire*, no. 13883; Fish Lake, Sevier Co., Utah, 8900 ft., *Maguire*, nos. 16200, 16203, 16174, and 16222; Bear River Refuge, Box Elder Co., 7200 ft., *Maguire*, no. 3182; all of these collections from Utah.

Potamogeton Berchtoldi Fieb. var. *tenuissimus (Mert. & Koch) Fernald, *P. pusillus* L. var. *tenuissimus* Mert. & Koch. Bear River Refuge, June 18, 1936, *Maguire et al*, no. 14003; and two collections, *Piranian & Hobson*, nos. 13990, June 24, 1936, and 15997, June 23, 1936, all from the Bear River Refuge, Box Elder Co., Utah.

The excellent distribution maps of Fernald reveal no localities for the cosmopolitan *P. Berchtoldi* (*P. pusillus*) in Utah or in any

of the contiguous states. Rydberg, (1906) cites three localities from Colorado. The typical form as indicated by the above collections is obviously not uncommon in the state. The var. *tenuissimus* is known thus far only from the brackish waters of the Bear River Refuge.

*Potamogeton Robbinsii Oakes, Stanley Lake, Challis National Forest, Custer Co., Idaho, July 30, 1934, *A. S. Hazzard.*

The above collection apparently extends considerably southward the known range of the species, rare in the Intermountain Region, and previously unknown from the Great Basin.

*Potamogeton tenuifolius Raf., abundant, in water 3–12 ft. deep, narrows near north end of Fish Lake, *Maguire,* no. 16208; common in water 6–12 ft. deep, vic. outlet Twin Creeks, Fish Lake, 8900 ft., Sevier Co., Utah, *Maguire,* no. 16220; Silver Lake, Brighton, Big Cottonwood Canyon, Salt Lake Co., Utah, *Maguire,* no. 13156.

This species is possibly the *P. alpinus* or *P. lucens* of the Tidestrom (1925) flora.

*Potamogeton zosteriformis Fernald, gravelly bottom, shallow water, east side of North Bay, *Maguire,* no. 16207; soft muck bottom, North Bay, *Maguire,* no. 16226; both collections from Fish Lake, Sevier Co., Utah, altitude 8600 ft.

The distribution records and map of this species, given in much detail in the recent monograph of Fernald (1932), show this locality to occur in the center of a vast area in which the plant has hitherto been unknown. The nearest station in any direction from this newly discovered one is over 500 miles distant.

*Najas flexilis (Willd.) Rostk. & Schmidt, subsp. **caespitosa** Maguire, subsp. nov. Plantae dense caespitosae, 2–4 (5) cm. altae; foliis integris; testis cum (40) 50–70 seriebus longitudinalibus areolarum circum semen.

Plant densely fastigiately cespitose, 2–4 (5) cm. high; leaf margins essentially entire, rarely provided with a few fine spines; seed coat finely reticulate with (40) 50–70 longitudinal rows of areolae; in other critical characters similar to typical *Najas flexilis.*—Type. Common, sand-gravel bottom, shallow water to 12 in., Pelican Point, Fish Lake, 8600 ft., Fish Lake National Forest, Sevier Co., Utah, Aug. 3, 1940, *Bassett Maguire,* no. 19888. Cotype. Fish Lake, Sevier Co., Utah, *Maguire,* no. 19882; channel north end, Fish Lake, Sevier Co., Utah, Aug. 24, 1938, *G. H. Jensen & L. Dargan,* no. 201.

This interesting dwarfed population is known only from Fish Lake, Utah, but there occurs in abundance and with remarkable uniformity of size, habit and habitat. All of the plants vary between 2–4 cm., rarely 5 cm. in height, and grow in a narrow zone of sand-gravel bottom in water from 6–12 in. in depth. Prolonged search failed to reveal plants growing in deeper water or different habitat. Dr. R. T. Clausen (1940), competent student of *Najas*, who recently visited Fish Lake, and there studied the plant under field conditions, wrote, "Field observation of the plants strengthens my opinion that the population in Fish Lake is part of the collective species, *N. flexilis*, but I now incline more than ever to regard it as worthy of subspecific status."

*NAJAS GUADALUPENSIS (Spreng) Morong, locally common, shallow water with *Sagittaria cuneata*, *Zannichellia*, and *Chara*, pool, south end Oxbow Pond, ½ mi. s. Smithfield Sugar Refinery, Cache Co., Utah, Oct. 10, 1940, *Maguire*, no. 20198.

This species has apparently not previously been known from the entire Great Basin-Intermountain Region (Clausen, 1936).

NAJAS MARINA L., warm (80°–84° F.), hard-water springs, to 3 ft., growing on sandy bottom, Fish Springs, Juab Co., Utah, *G. H. Jensen & L. Dargan*, no. 203.

Recently additional material, but in condition too far disintegrated to preserve as record, has been submitted from Locomotive Springs, Box Elder Co., Utah.

Clausen (1936) gives the locality of the then known collection of *N. marina* as "Central Utah." Although the original collection from Utah may thus have been from one of the two stations recorded above, there now exists two definite localities for the species. In all probability it is of more widespread occurrence in the warmer and somewhat saline spring waters of western Utah.

*LILAEA SUBULATA H. B. K., in wet soil at edge of pond, vic. Shoshone Ranger Station, Minidoka National Forest, Twin Falls Co., Ida., *R. K. Gierisch*, no. 780.

This remarkable collection is apparently the first recorded for interior Western America. Its range hitherto has been known only from the Pacific Coast region, extending from British Columbia to South America. Muenscher (1938) has recently discussed the distribution of this aquatic.

Anacharis canadensis (Michx.) Planchon, shallow water in pond, 2 mi. N. Oxford, Bannock Co., Ida., Sept. 18, 1932, *Maguire*, no. 3194; common, in water 6–12 ft. deep, Fish Lake, 8600 ft., Sevier Co., Utah, Aug. 25, 1938, *Maguire*, no. 16221; abundant, shallow and deep water, State Reservoir, Logan Canyon, vic. Logan, Cache Co., Utah, Oct. 18, 1940, *Maguire*, nos. 20262, 20263; common in water 6–15 ft. deep, Strawberry Reservoir, Wasatch Co., Utah, July 8, 1938, *G. H. Jensen & L. Dargan*, no. 87.

Tidestrom (1925) cites *A. canadensis* only from Panguitch Lake, Utah.

All specimens cited herein are deposited in the Intermountain Herbarium, Utah State Agricultural College.

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Utah State Agricultural College

Polygala vulgaris new to the North American Flora.—This odd little plant, *Polygala vulgaris* L., was found growing wild at Comox, Vancouver Island, British Columbia, in May, 1941, and referred through Mrs. L. Planta to the Provincial Museum, Victoria. My identification was confirmed at the Gray Herbarium, Harvard University, by Bernice G. Schubert. Professor M. L. Fernald, the Director, also informed me in a previous letter that its occurrence in the wild state in North America was at that time unknown. Mrs. Planta states that "it was growing on a grassy bank by a roadside forming part of a field that had been seeded down with imported seeds," most probably of European origin, where *P. vulgaris* occurs in abundance.

The genus is well represented in North America in the more southerly and eastern parts, a few species extending into eastern Canada. As *P. vulgaris* is the type of the genus it is not without a certain prestige on that account. Its reaction to the new environment will be closely studied. Fortunately it brings with it no bad name as a weed.—G. A. Hardy, Provincial Museum, Victoria, British Columbia.

CYTOLOGICAL BASIS FOR SPECIFIC SEGREGATION IN THE SEDUM NEVII COMPLEX

J. T. Baldwin, Jr.[1]

With reference to *Sedum Nevii* Gray, Wherry (1935)[2] wrote: "The best evidence at present available indicates the real range . . . to be from central Georgia to Alabama, southernmost Illinois, easternmost West Virginia, and central Virginia."[3] Cytological study of plants of this complex from Alabama and from Virginia has revealed chromosomal differences of specific magnitude.

In early April of 1937 Dr. A. V. Beatty sent the writer flowering, living specimens of a sedum—supposedly of *S. Nevii*—from Pratt's Ferry Bridge, Bibb County, Alabama. They differed in appearance and in chromosomes from *S. Nevii* as the writer knew the species in Virginia. Some of Beatty's plants were transmitted to R. T. Clausen of the Bailey Hortorium, where they were accessioned as number C 108. Concerning this sedum, Dr. Clausen, in a letter of May 25, 1937, wrote: "It is a puzzling specimen, which seems most nearly related to *Sedum Nevii*, from which it differs, however, in flower size, shape of leaves, sterile shoots, and markedly in habit"; he gave the plant provisional nomenclatorial designation as a variety of *S. Nevii*.

Accompanied by Dr. Roland M. Harper and Dr. Beatty, the writer, on July 17, 1940, visited the above station in Bibb County.

[1] Supported by Faculty Research Fund of the University of Michigan, Project No. 540.

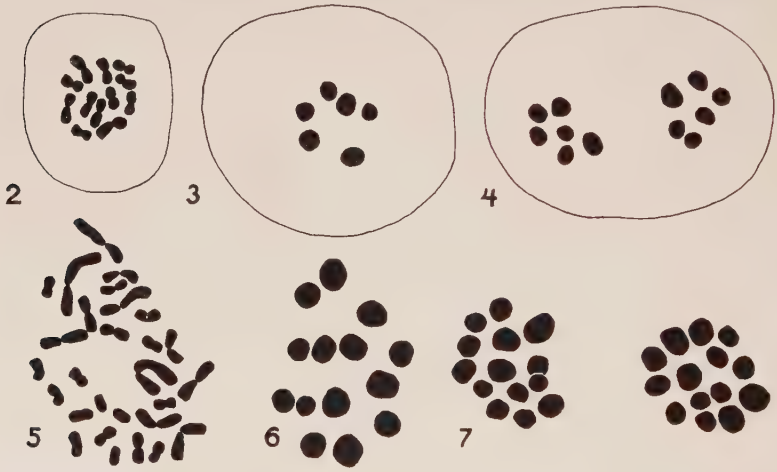
[2] Wherry, E. T. 1935. The ranges of our eastern parnassias and sedums. Bartonia No. 17: 17–20.

[3] The writer has collected tetraploid plants of *S. pulchellum* Michx. at Cobden, Union County, and at Sanburn, Johnson County, Illinois. Since juvenile stages of this species are often confused with the *S. Nevii* complex, Illinois records for the latter are most likely based on collections of the former. The *S. Nevii* complex apparently does not extend westward out of the Appalachian Mountains.

Photo. Dr. Ralph Bennett

FIG. 1, SEDUM NEVII: flowering plant from Alabama, *ca.* 0.5×

There the sedum grew in matted clumps on damp limestone ledges and on mossy tree-trunks to a distance of about two feet above ground. Growing there too were *Acer leucoderme* Small, *Quercus Durandi* Buckl., *Croton alabamensis* Smith, *Asclepias verticillata* L., *Sedum ternatum* Michx., *Smilax* sp., *Euphorbia* sp. and *Vernonia* sp. The following day we found the sedum in Tuscaloosa County, in the first ravine below lock 13 on the west bank of the Warrior River, about eight miles from Tuscaloosa. Associated with the plant, or nearby, were, among other species:



Mitotic and meiotic metaphases of the SEDUM NEVII complex. FIGS. 2–4, Alabama plants: $2n = 12$ in root-tip cell; $n = 6$ at first and second metaphase of microsporogenesis. All *ca.* 1330×. FIGS. 5–7, Virginia plants: $2n=28$; $n=14$. All *ca.* 3330×.

Neviusia alabamensis Gray, *Illicium floridanum* Ellis, *Croomia pauciflora* (Nutt.) Torr., and *Polymnia laevigata* Beadle.

The sedum was transplanted from these two stations to the University of Michigan Botanical Gardens. Specimens at one station looked different from those at the other but after a few weeks in the greenhouse could not be told apart. They flowered during March and April of 1941 (FIG. 1). The chromosomes were counted in aceto-carmine smears of root tips and of anthers: $2n = 12$ (FIG. 2), $n = 6$ at first (FIG. 3) and at second (FIG. 4) metaphase.

The Virginia representatives of this complex are what is usually called *S. Nevii*. Whether the name is properly applied

to them or whether it should be reserved for the species as found in Alabama is a matter for the taxonomist to decide.[1] Plants from three stations in Virginia have been investigated: Boyce, Clarke County; Roanoke, Roanoke County, and Mountain Lake, Giles County. Chromosomes of these plants were examined in smears of roots and anthers: $2n = 28$ (FIG. 3), $n = 14$ at first (FIG. 6) and second (FIG. 7) metaphase. Plants growing on different boulders at Mountain Lake varied somewhat in aspect but became alike under greenhouse culture; no differences in chromosomes were established.

If the Alabama and Virginia plants were euploid in relation to each other, *i. e.*, 12–24 or 14–28 in $2n$-numbers, and the chromosome set in each was morphologically comparable, the writer would not take the initiative, in spite of obvious phenotypic dissimilarities, of saying that two species are present in the *Sedum Nevii* complex. But the $2n$-number relationship is 12–28, and the chromosomes of the two sets are likewise unlike in size-range and in morphology. Two species are represented: many unpublished cytological data on *Sedum* support this conclusion.

To discover in this complex plants with a $2n$-number of 24 would not be surprising: their existence is here postulated; if found, it is expected that they will be referable to the species of which the Alabama plants are members.

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THE DISSEMINATION BY ANTS OF THE SEEDS OF BLOODROOT, SANGUINARIA CANADENSIS

BURTON N. GATES

IN RHODORA[2], reference was made to the observations of Dr. E. B. Southwick[3], who had seen ants carrying the seeds of

[1] *Sedum Nevii* Gray was briefly described by Asa Gray in Mem. Am. Acad. n. s. vi. 373 (1858), from a specimen sent by Rev. R. D. Nevius from along cliffs near Tuscaloosa, Alabama. In 1860 Chapman, Fl. So. U. S. 150, acknowledging in his preface the coöperation of Gray, gave a fuller description of *S. Nevii* from the Tuscaloosa material of Nevius; and in Gray, Man, ed. 5: 172 (1867) Gray included the plant of Salt Pond Mountain, Virginia under *S. Nevii*. True *S. Nevii* is, therefore, the Alabama plant.—EDS.

[2] BURTON N. GATES. Dissemination by Ants of the Seeds of *Trillium grandiflorum*. RHODORA, Vol. 42, No. 479, 1940, p. 196.

[3] As told by Dr. William Morton Wheeler. Ants, 1910, p. 315.

Bloodroot, *Sanguinaria canadensis* L., and feeding on their caruncles. Since this behavior is closely related to the reaction of ants toward seeds of *Trillium grandiflorum*, as reported by the author[3], parallel observations have been made with the Bloodroot seeds.

These seeds have a pronounced caruncle, suggestive of a cock's comb, mounted as a crest on the seed. Differing from the caruncle of the Trillium seed, which is spongy and somewhat viscous, that on the Bloodroot seed is dry to the touch, elongated like a sausage, but with slight constrictions giving the caruncle a crinkled, wavy appearance. Transparent, filled with a firm gelatinous material which has no apparent taste to humans, it is approximately one-third the volume of the seed. The containing membrane is highly lustrous, resembles cellophane marked with milky-white, translucent blotches. Unlike Trillium seeds, which ants gnaw out of the capsule when it falls to the ground, Bloodroot seeds, being dry, rattle from their long tapering pod upon dehiscence.

Seeds were found to be ripe and falling, June 12, 1941 (Worcester, Mass.). When first observed, ants were roving beneath the plants, where a dozen or more of the bright, polished, red-orange seeds had fallen. Their color is almost identical with that of the juice exuded by the stems. However, it was impossible to detect that the ants were paying any attention to the fallen seeds. It was probable that some seeds had already been carried off by the ants, inasmuch as there remained too few seeds in relation to the opened seed-pods.

Freshly gathered Bloodroot seeds were then offered indiscriminately to ants found about the grounds, including some near the Bloodroot plants. In nearly all instances the ants were interested at least in biting the caruncle. Ants too small to carry a seed, mounted it and gnawed at the caruncle. A few ants were dropped into a small dish of collected seeds; they frantically tried to carry them off.

Fresh seeds were then offered at random to a series of ants, in order that those making positive reaction might be collected for identification. At one station, although a number of ants were

[3] Ibid and also in the sequel, Observations in 1940 on the Dissemination by Ants of the Seeds of *Trillium grandiflorum*. Rhodora, Vol. 43, No. 509, 1941, p. 206.

offered a seed, some merely crawled over it and hesitated; nearly all turned toward it and showed some interest in it. None of these ants, however, picked up the seed, although they were large enough to have done so. There was indication that the ants reacted less quickly and precipitously to the Bloodroot seeds, in some instances, than they did to the Trillium seeds in the 1939 and 1940 experiments.

Twelve ants, however, made prompt, positive reactions, usually dragging away the seed; these ants were collected and identified[1]. The twelve specimens comprised three species: the largest, *Formica neogagates*, the middle sized, *Myrmica emeryana*, the smallest, *Lasius americanus*. *Lasius americanus* is the only species which was also a positive reactor to the *Trillium grandiflorum* seeds[2] in 1940.

The Bloodroot plant, like the Trillium, has no mechanical means of disseminating its seeds. Dissemination is apparently effectively accomplished by ants which respond to the lure of the caruncle. Strasburger[3] accounts for the attractiveness of this lure to ants by the presence of an abundance of oils, explaining "the distribution of certain seeds by ants . . . , attracted to remove and accumulate the seeds, by the abundance of oil in the elaiosome-containing tissue of the appendages, such as the caruncle."

Massachusetts Department of Agriculture,
State House, Boston, Mass.

Euphorbia glyptosperma in Massachusetts.—In the routine work of identifying plants received by a department of Botany, one occasionally chances upon a specimen of more than ordinary interest. Such was a lawn weed sent in recently by Mr. T. A. Bachand of Huntington, Massachusetts, and which we identified as *Euphorbia glyptosperma* Engelm. Through the kindness of the Gray Herbarium the specimen was submitted to Dr. L. C. Wheeler who recently contributed to Rhodora a revision of the *Chamaesyce* section of *Euphorbia*. Dr. Wheeler

[1] All identifications were made by Mr. Lawrence G. Wesson, Jr., Boston, Mass., whose kindness is much appreciated.

[2] Ibid., Rhodora, 1941.

[3] Strasburger's Text-book of Botany. Fifth edition, by Dr. Fitting and others. 1921. p. 586–7.

writes us: "So far as I have any record this is the first collection of the species in Massachusetts, but in view of its general wide range and its occurrence in adjacent states, its presence in Massachusetts is not surprising."

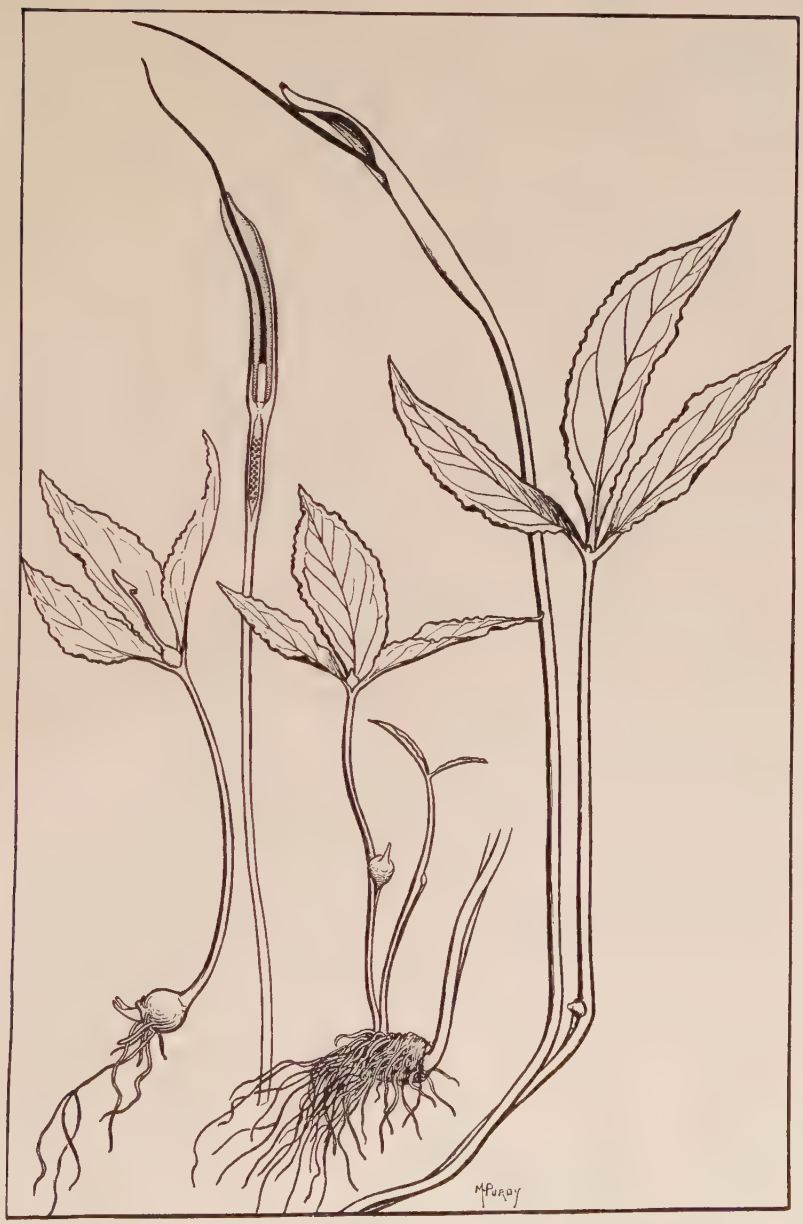
Mr. Bachand responded graciously to a request for additional material by sending us some thirty plants, of which about one-third were the common *Euphorbia maculata* L. So the two species were apparently growing in close association.

Sheets have been deposited in the Gray and the New England Botanical Club Herbaria, also at the National Herbarium in Washington and at the Massachusetts State College.—R. E. Torrey, Massachusetts State College, Amherst.

PINELLIA TERNATA IN BROOKLYN, NEW YORK

Mary-Elizabeth Pierce

To the lengthening list of exotic plants which seem able to maintain themselves adventitiously in eastern United States should be added *Pinellia ternata* (Thunb.) Breitenbach, a member of the Araceae widely distributed in China and Japan. The ternately dissected leaves, about eight inches high, and the slender, typically aroid flower-stalk, ten to twelve inches long, arise from a brittle, subterranean rhizome. Bulblets are produced on the leaf-stalk, both below the ground line and at the joining of the leaflets. These bulblets sometimes sprout into young plants before they fall from the parent stem. The colony at the Brooklyn Botanic Garden was discovered in August of 1941 on a grassy bank near a brook. It covers several square feet and seems to be well established. In fact, we suspect that this is not its first year with us and wonder how long it has escaped notice. With its bulblets and root-stocks it seems able to make itself thoroughly at home. The plants were in flower about the tenth of August. Just how the plant was introduced is quite a mystery, since no new planting has been made in that area for at least five years. In the National Herbarium there is a specimen labeled *Pinellia tripartita* collected in Golden Gate Park, San Francisco, in May of 1935, "accidentally introduced." This specimen closely resembles our plant and from the published descriptions there seems to be very little difference be-



M. Purdy del.

PINELLIA TERNATA, about ½

tween the species. There is a possibility that *Pinellia ternata* might be of some use as a ground-cover, but the writer would hesitate to plant it in competition with any horticultural treasure. Since the species does not seem to have been adequately illustrated, Miss Purdy has kindly made the accompanying drawing.

BROOKLYN BOTANIC GARDEN

TWO PLANTS NEWLY ADVENTIVE IN NORTH AMERICA

E. J. ALEXANDER

Two interesting east Asiatic plants have made their appearance within the last few years in the local area around New York. Since neither has been cultivated in the United States, they are clearly adventives, and show evidence of persisting as newcomers to the flora of North America.

In June of the present year, when the writer was giving a lecture on wild flowers to the Flushing Garden Club, one of the club members, Mrs. Ralph Stoddard, brought up a specimen of a creeping, vine-like plant with dandelion-like flowers which had appeared in her lawn and persisted there several years. No one had ever seen anything like it, nor could they identify the plant. Upon dissection of one of the flower-heads the plant was found to be a species of *Lactuca*. Checking through that genus it was found to be *Lactuca stolonifera* (Gray) Maxim., native in Shantung, the Corean Archipelago and Japan. The habit of the plant is totally unlike our familiar lactucas. It is a delicate creeper, rooting at the nodes and sending up 1–2-flowered peduncles 8–10 cm. tall, the heads about 2.5 cm. across in flower. The leaf-blades are 1–2.5 cm. long, ovate, entire, pale green, glaucous beneath, on long, slender petioles, the entire plant glabrous. The only station so far recorded is in Flushing, N. Y. but the plant may appear elsewhere. A specimen has been deposited in the herbarium of the New York Botanical Garden.[1]

The second plant is equally interesting. In July, 1937, Mr. Robert W. Storer sent to the New York Botanical Garden a

[1] *Lactuca stolonifera* was brought to the Gray Herbarium in June, 1939, by Mrs. Stillman P. Williams, as "a pest" in a garden at Media, Pennsylvania.—EDS.

sketch of a strange aroid that was well established in a rhododendron and azalea planting at the railroad station in South Orange, New Jersey. The sketch suggested *Arisaema Dracontium*, but the flowering season was too late and the plant too small, so a specimen was asked for, which Mr. Storer sent in August. The plant was then identified by Mr. Joseph Monachino as *Pinellia ternata* (Thunb.) Breitenb., native of China, Corea and Japan. A second specimen was received later, also from New Jersey, but no record of it was kept. Recently, the writer was shown a weed that had appeared in rhododendron plantings in the Brooklyn Botanic Garden. No flowers had been seen on this plant, but it had a strange habit of forming bulbils at the apex of the petiole between the three leaflets and also out of the lower groove of the petiole. A careful comparison of the leaf-venation, and of the petiole and bulbil-structure indicated that this plant was also *Pinellia ternata*, and subsequent flowering confirmed it. This plant has been recorded as an escape in several botanic gardens in Germany, but its source of introduction to this country is a mystery, although it may have come in the form of seed in imported peat-moss. It is possible that further records of it may be obtained by a search of rhododendron plantings in various localities. The flowering period so far recorded is from late June into August. *Pinellia ternata* resembles a miniature Jack-in-the-pulpit when not in flower, but the leaves are closely crisped-undulate on the margin. The flower-structure is very different. The spathe is slender, the base of the spadix adnate to it on the dorsal side, with pistillate flowers only on the free side, the spathe then constricted for a short distance, the spadix bearing staminate flowers on all sides above the constriction and terminating in a long-tapering, purple and green tail. The plant, however, may be recognized at any time by the several-scaled, red-streaked bulbils between the leaflets and on the petioles.

New York Botanical Garden

CAREX TYPHINA IN MAINE.—On August 26, 1940, the writer was exploring the shores of Wayne Pond or Androscoggin Lake which lies partly in Leeds, Androscoggin County, Maine, and partly in Wayne, Kennebec County. The particular object of the search was *Nyssa sylvatica* which had been reported in that region years before. Two small trees of this species were found.

However, on the westerly shore of the lake a Carex was found which looked unusual. This proved to be *Carex typhina* Michx., which Prof. Fernald tells me has not previously been known east of the Connecticut Valley. On further search in the section known as the "Cape", where the Dead River has made a long tongue of land running into the Lake for a mile, a second station for the Carex was found. Both stations are in Leeds, Androscoggin County, Maine.—RALPH C. BEAN, Wakefield, Massachusetts.

A PURPLE-FLOWERED FORM OF CORNUS CANADENSIS.—Prof. Fernald recently reported the form with purple involucres from North America. The corresponding form in Asia was, however, published by Prof. Miyabe and Dr. Tatewaki from Saghalin in 1937 under the generic name, *Chamaepericlymenum*. So the following combination is necessary under *Cornus*.

CORNUS CANADENSIS L., f. **purpurascens** (Miyabe et Tatewaki), comb. nov. *Chamaepericlymenum canadense* f. *purpurascens* Miyabe et Tatewaki in Trans. Sapporo Nat. Hist. Soc. **15:** 43 (1937). *Cornus canadensis* f. *rosea* Fernald in RHODORA **43:** 156 (1941).—H. HARA, Tokyo Imperial University.

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